

Claims

[c1] What is claimed is:

1. A memory management method used in the decoding process of a video frame, for storing motion vector(s) of a decoded first macroblock as candidate predictor(s) for future use in the decoding process, the method comprising:

allocating a first memory space and a second memory space in a first memory, wherein each of the first and the second memory spaces is sufficient for storing one motion vector; and

when the first macroblock comprises only one first motion vector, storing the first motion vector in the first or the second memory space.

[c2] 2. The method of claim 1, further comprising:

when the first macroblock comprises a first block, a second block, a third block, and a fourth block, storing the motion vector of the third block in the first memory space and storing the motion vector of the fourth block in the second memory space.

[c3] 3. The method of claim 1, wherein the video frame is a progressive frame.

- [c4] 4. The method of claim 1, wherein the video frame is an interlaced frame.
- [c5] 5. The method of claim 4, further comprising:
when the first macroblock comprises a first field and a second field, storing the motion vector of the first field in the first memory space and storing the motion vector of the second field in the second memory space.
- [c6] 6. The method of claim 1, wherein the first memory is a DRAM, an SRAM, or registers.
- [c7] 7. A memory management method used in the decoding process of a video frame, for storing the motion vector(s) of a decoded first macroblock as candidate predictor(s) for use in decoding a next macroblock, the method comprising:
allocating a third memory space and a fourth memory space in a second memory, wherein each of the third and the fourth memory spaces is sufficient for storing one motion vector; and
when the first macroblock comprises only one first motion vector, storing the first motion vector in the third or the fourth memory space.
- [c8] 8. The method of claim 7, further comprising:
when the first macroblock comprises a first block, a sec-

ond block, a third block, and a fourth block, storing the motion vector of the third block in the third memory space and storing the motion vector of the fourth block in the fourth memory space.

- [c9] 9. The method of claim 7, wherein the video frame is a progressive frame.
- [c10] 10. The method of claim 7, wherein the video frame is an interlaced frame.
- [c11] 11. The method of claim 10, further comprising:
when the first macroblock comprises a first field and a second field, storing the motion vector of the first field in the third memory space and storing the motion vector of the second field in the fourth memory space.
- [c12] 12. The method of claim 7, wherein the first memory comprises processing registers, registers, a DRAM, or an SRAM.
- [c13] 13. A row-based memory management method used in the decoding process of a video frame, for storing the motion vectors of a plurality of decoded macroblocks as candidate predictors for use in the decoding process, wherein each row of the video frame comprises N macroblocks, the method comprising:
allocating N memory units in a first memory, wherein

each memory unit is sufficient for storing the motion vector(s) of one macroblock;
when a first macroblock located at an L^{th} row and a K^{th} column is decoded, storing the motion vector(s) of the first macroblock in a K^{th} memory unit of the memory units to overwrite the motion vector(s) of a second macroblock previously stored in the K^{th} memory unit, wherein the second macroblock is located at an $(L-1)^{\text{th}}$ row and the K^{th} column, K is an integer between 1 and N , and L is an integer larger than 1.

[c14] 14. The method of claim 13, wherein the video frame is a progressive frame.

[c15] 15. The method of claim 13, wherein the video frame is an interlaced frame.

[c16] 16. The method of claim 13, wherein the first memory comprises a DRAM, an SRAM, or registers.

[c17] 17. The method of claim 13, further comprising:
allocating an additional memory unit in a second memory, wherein the additional memory unit is capable of storing the motion vector(s) of one macroblock;
when a third macroblock of the video frame is decoded, storing the motion vector(s) of the third macroblock in the additional memory unit to overwrite the motion vec-

tor(s) of a fourth macroblock previously stored in the additional memory unit, wherein the fourth macroblock is decoded immediately before the third macroblock.

- [c18] 18. The method of claim 17, wherein the first memory comprises processing registers, registers, a DRAM, or an SRAM.